



Institutional Status Review 580/Information Systems Center

November 22, 2000



AGENDA



- **TECHNOLOGY HIGHLIGHTS**
- **PARTNERING**
- **OUTREACH**
- **INSTITUTIONAL STATUS**
 - **Papers, Conferences, and Seminars**
 - **Personnel**
 - **ISO 9000 QMS**
 - **Safety**
- **GOOD NEWS**



ISC Technology Highlights



Technology Activity/Project	Customer	Lead Code(s)	Major Accomplishments/Highlights/Comments	Status			
				Tech Issues	Schedule Issues	Cost Issues	Staffing Issues
Wide-Field Infrared Explorer (WIRE) Testbed		581	<p>The WIRE Flight Operations Team (FOT) and spacecraft participated in the Inspection 2000 demo at JSC November 1-3, 2000. Two live spacecraft passes were supported each day from a booth at JSC via 3 different ground data systems:</p> <ol style="list-style-type: none"> 1. A connection from Houston through the SMEX MOC to Poker Flat via closed IONET, 2. A connection from Houston to DataLynx via Internet 3. A connection from Houston to USN/Hawaii via Internet. Passes on Wed. and Thurs. were supported from a laptop, and the passes on Friday were supported via a Palm VII PDA. <p>Support includes commanding (benign no op commands) and telemetry.</p>				

Activity	Issue Code	Issue	Action



ISC Technology Highlights



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Flight Software (FSW) Prototype	582, 588, AIST	582	<ol style="list-style-type: none"> 1. Committed to lead and staff a prototype development of the CFDP protocols for space-to-ground link. The CFDP capability will be incorporated into either the MAP or Triana FSW system within the 582 technologies lab. 2. Initial experiments and porting of the MAP data system to CORBA have been performed. 3. Both RTEMS & Lynx OS development platforms have been setup for the Power PC 750 rack. 4. The Posixperf realtime POSIX benchmark has been set up and executed under Linux and LynxOS on the Power PC 750. 5. Initial coding of cloud detection algorithms has been completed. Additional algorithms to detect sunglint, snow/ice and sand are being considered. Initial FPGA implementation plans are maturing. 				

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FSW Standards	582	582	<ol style="list-style-type: none"> 1. Attended the 3rd Meeting of the CCSDS Standard On-board Interfaces (SOIF) Panel (P1K) Meeting in Toulouse, France under the Flight Software Advanced Operating Systems Research Support (FSWAOSRS - pronounced fiz-wow-zers) 2. Participated in three technical meetings related the use of CCSDS protocols for the spacelink and onboard spacecraft. Attended two meetings related to the evolution of standard objects for flight software including the Object Management Group Space Domain Task Force and CORBA. 3. Attended the IP Workshop at GSFC 11/13-11/15. Proposed to incorporate IP as default protocol into the branch FSW test lab for CFDP prototype and other initiatives. 				

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FSW Requirement Tool	582	582	Initiated contractor support for development of the automated FSW requirements generation tool prototyped in 1996. Refined tool requirements document and user approach. Evaluated and selected COTS tools for implementation.				
FSW Product Line	582	582	Contracted with a highly recognized Product Line consultant to facilitate further branch investigations into a formal branch FSW Product Line and library. FSW Team Leads will be meeting routinely as a group with the consultant. An approach will be selected and committed to.				
FSW Techniques	582	582	Agreed to 6 month .75 assignment of Dave McComas to Code 588 for hands-on experience with XML and other new software engineering techniques.				

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Space Network Web Services Interface (SWSI)	453	583	Tom Sardella completed a Requirements/Design Review in October for the SWSI, a cross-platform customer interface to perform TDRS scheduling and realtime service monitoring and control.				
Aqua Flight Dynamics System (FDS)	ESDIS 423	583	Completed Aqua FDS Information Technology Risk Management Plan in response to NPG 2810.1				
NASA Software Working Group	HQ	583	<ol style="list-style-type: none"> 1. Completed definition and implementation of website for metrics collection during agency-wide metrics pilot project 2. Completed final review of NPG 2820 (NASA Software Guidelines) in preparation of submission to NASA HQ for agency review 				

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Advanced System for Integration and Spacecraft Test (ASIST)		584	ASIST (a Goddard-developed command and control system used by IMAGE, MAP, EO-1 and many instruments) is now running on standard PC's using the Linux Operating System.				
JINI Object Information Network (JOIN)		588	The JOIN project distributed the first draft of Use Cases on 10/2/2000. The JOIN project also gave a demo of the Digital Library prototype on 10/23/00.				
Scientist's Mission Assistant and Research Tool (SMART)		588	The SMART project demonstrated their initial prototype to SOMO. SOMO is very interested in using it as a front end to their SOMO Standard Services Ordering Tool (SSSOT).				

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ISC Technology Highlights



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Proposals	NASA Cross Enterprise Technology Development Program (CETDP) NRA	583 584 588	<ol style="list-style-type: none"> 583/ "An Architecture for Constellation Management Automation" was selected by the NASA CETDP to receive \$1.1M over next 3 years. 584/ROSS 2000 AISR Proposal "Architectures for Science Event Notification Networks" submitted. 584/Intelligent Systems Step 2 proposal "Ocean Color Model Inversion Using an Analog, Artificial Neural Network" submitted. 584/Intelligent Systems Step 2 proposal "Coupling Humans and Machines with Wearable Voice Activated Computers" submitted. 584/(NRA) 99-OSS-05 for the Cross Enterprise Technology Development Program, # 537 "Resource Management for Real-Time Adaptive Agents" selected for funding. PI is Lonnie Welch, Ohio University. Co-Is are Barb Pfarr & Karen Keadle-Calvert, Code 584. 584/Tim Ray/SOMO proposal prototyping the CCSDS File Delivery Protocol (CFDP) selected for funding. 584/SOMO proposal for IP security selected for funding. 588/ Submitted to the Intelligent Systems NRA: Deriving Formal specifications and Code from Scenarios Dr. Michael Hinchey/ UNO Col's: Chris Rouff & James Rash 				



ISC Partnering



- Jay Pittman/Code 584 presented an overview of Branch capabilities to Observational Sciences Branch Code 972 at Wallops-expecting some additional SOWs to support oceanographic research, perhaps in instrument development/optimization, instrument control tools, or visualization/analysis of data
- Mary Reph/586 and David Matusow/588 attended the Applied Information Systems Research Program's Annual Workshop in Boulder, Colorado, in order to investigate additional partnering and technology opportunities



ISC Partnering



- Bill Potter/586 presented the ASF Business Plan for privatizing ASF to NASA HQ and NOAA - the plan calls for Alaskan companies and organizations to partner with ASF and the University of Alaska, Fairbanks
- 588/The InVision team met with Scott Action, a professor at UVA to discuss maintenance/continuing work agreement on Image2000
- 588/Walt Truskowski attended a technical exchange and collaboration meeting at JPL - a draft collaboration agreement was written for our Multi-Agent Systems work



ISC Outreach



- Bill Guit/Code 581 conducted a “Space Day” at the Prime-Time Day Care Center in Calvert County for 100 pre-Kindergarten children
- Cindi Adams/Code 584 attended Bowie State Career Fair on September 20, 2000
- Barb Pfarr/Code 584 attended Ohio University Career Fair on September 27, 2000
- Ken Lehtonen/Code 584 selected as mentor in Goddard Mentoring Program for Fiscal Year 2001



ISC Outreach



- Dennis Small and Cindi Adams/Code 584 are continuing to lead AETD Minority Mentoring Program for a second year
- Code 586/The Astronaut Class of 2000 toured the GES DAAC



ISC Institutional Status



➤ Papers, Conferences, and Seminars

- Tim Ray/Code 584 attended Small Satellite Conference in Logan, Utah in August, 2000 and the CCSDS Panel 1A Fall Workshop in Madrid Spain
- Ryan Detter and Barb Pfarr/Code 584 presented “Adaptive Management of Computing and Network Resources for Spacecraft Systems” at MAPLD conference at the Johns Hopkins APL, September 27, 2000
- Dwayne Morgan, Code 584.W, contributed an article on the Flight Modem project to the “SN Integrator”.



ISC Institutional Status



- Papers, Conferences, and Seminars (Continued)
 - Codes 586/587 in conjunction with Jack Trombka/691 hosted a successful Science Data Processing Workshop at GSFC- Over 170 software programmers/engineers, data system managers, project managers, scientists attended case study presentations, poster sessions, tools and techniques sessions and participated in splinter sessions to develop ideas for improving science data processing- Recommendations and next steps were developed by the splinter groups
 - Posters representing work of Code 586 were presented by Jeanne Behnke, Betty Brinker, Joy Henegar, Evelyn Ho, Bob Lutz, Bob Schweiss, and CommerceOne, MEDS personnel
 - Dan Marinelli/586 presented a case study on EOSDIS Science Data Processing
 - Steve Kempler/Code 586 (with the help of Jeanne Behnke and Jessica Matthews) led the data accessibility and archive splinter
 - Rich Ullman/586 presented a tools and techniques session on "Experience with HDF in EOSDIS"



ISC Institutional Status



- Papers, Conferences, and Seminars (Continued)
 - Code 586/Over 120 data providers, end users, and tool providers came together for the fourth annual HDF-EOS Workshop
 - Matt Schwaller/Code 586 presented an invited paper on data system development plans to a Global Observation of Forest Cover (GOFC) workshop and attended a Committee on Earth Observations Satellites (CEOS) meeting in support of NASA network and data system demonstrations directed to the Global Observation of Forest Cover program
 - Walt Truskowski/Code 588 supported the First AIAA Technical Town Meeting which was held on October 26, 2000 at the Applied Physics Laboratory (APL)



ISC Institutional Status



- Papers, Conferences, and Seminars (Continued)
 - Stan Scott/Code 586 presented the status and summary of the EOS Instrument Team Software - DAAC/ECS IRD to the Aura Data System Working Group meeting. Positive feedback on the science data processing software requirements in the IRD was obtained from the Aura science teams during the presentation
 - Ken McDonald/Code 586 presented the status of subgroup activities, in particular support to the Global Observation of Forest Cover (GOFC) program, at the CEOS Working Group on Information System and Services (WGISS) meeting at the European Commission's Joint Research Center in Ispra, Italy and participated in the Aura Data System Working Group meeting in Easton, presenting the Machine to Machine Gateway search and order interface



ISC Institutional Status



- Papers, Conferences, and Seminars (Continued)
 - Code 580 had significant participation in the just completed "IP in Space" workshop held at GSFC this week. There was about 125 attendees from Government, Academia, and Industry. Code 588/OMNI Project played a leadership role in the planning and execution of this workshop



ISC Institutional Status



➤ Personnel

– GSFC Departures

- Jonathan Wilmot/Code 582 resigned to join industry
- Jackie Mims/Code 586 resigned to join industry
- Chris Rouff/Code 588 resigned to join industry
- Herman Williams/Code 581 resigned to join industry

– Open Positions

- 581/CPP, Ground Operations Systems Engineer, on board, closes 11/30/00
- 581/CPP, Computer Engineer(HSTOMS), Cert received, interview in progress
- 584/All Source, Computer Scientist, posted, closed 11/17/00, awaiting Cert



ISC Institutional Status



➤ Personnel (Continued)

– Transfers within GSFC

- Mike Seablom/Code 931 was named as the new Branch Head of Code 586
- Carlos Gomes/Code 549 was reassigned to Code 581
- Vicki Moran/Code 563 was named new Mission Director of Code 581
- Maureen Armbruster/Code 568 was named as new Software Test Engineer of Code 582

– New Hires/Conversions

- ISC interviewing fresh out candidates from Cert



ISC Institutional Status



➤ ISO 9000 QMS

- Code 583/Completed draft version of GPG 8700.5 (Software Development and Maintenance Procedure) and submitted it to Code 300
- Code 586/Triana Product Development Handbook was updated per internal audit recommendations-one issue remains to be resolved, one that impacts all ISC Product Plans, the GPG change that removes the provision for minor NCR systems

➤ Safety

- Code 580/The Courtyard “Biosphere” of Building 23 was closed/restricted access (could be for months) due to falling cinder blocks



ISC Good News



- Gail McConaughy/Code 586 was named "champion" of Flight and Science Information Systems for the FY 01 IR&D effort
 - Managed a team of representatives from Codes 500, 600, and 900 who evaluated IR&D proposals covering technology investment areas across the disciplines: flight processing, advanced missions, modeling/simulation, and data fusion/mining
- Matt Schwaller/Code 586 defended his Director's Discretionary Fund(DDF) proposal on delivery of EOS data to mobile computing devices



ACRONYMS



AETD	- Applied Engineering and Technology Directorate
AIAA	- American Institute of Aeronautics and Astronautics
AISR	- Applied Information Systems Research
AIST	- Advanced Information Systems Technology
APL	- Applied Physics Laboratory
ASF	- Alaska SAR Facility
ASIST	- Advanced System for Integration and Spacecraft Test
CCSDS	- Consultative Committee for Space Data Systems
CETDP	- Cross-Enterprise Technology Development Program
CEOS	- Committee on Earth Observations Satellites
CFDP	- CCSDS File Delivery Protocol
CoI	- Co-Investigator
COTS	- Commercial off-the-shelf
DAAC	- Distributed Active Archive Centers
DDF	- Director's Discretionary Fund
ECS	- EOSDIS Core System
EOS	- Earth Observation System
EOSDIS	- Earth Observation System Data and Information System
ESDIS	- Earth Sciences Data and Information System
FDS	- Flight Dynamics System
FPGA	- Field Programmable Gate Array
FSW	- Flight Software
FOT	- Flight Operations Team
GES	- Goddard Earth Science
GOFC	- Global Observation of Forest Cover
GPG	- GSFC Procedures and Guidelines
GSFC	- Goddard Space Flight Center
HDF	- Hierarchical Data Format



ACRONYMS



HSTOMS	-	Hubble Space Telescope Observatory Management System
HQ	-	Headquarters
IMAGE	-	Imager for Magnetopause-to-Aurora Global Exploration
IONET	-	IP Operational Network
IP	-	Internet Protocol
IRAD/IR&D	-	Internal Research and Development
IRD	-	Instrument Requirements Document
ISC	-	Information Systems Center
ISO	-	International Organization for Standardization
JOIN	-	JINI Object Information Network
JPL	-	Jet Propulsion Laboratory
JSC	-	Johnson Space Center
MAP	-	Microwave Anisotropy Probe
MAPLD	-	Military and Aerospace Applications of Programmable Logic Devices
MEDS	-	Multidisciplinary Engineering Development Services
MOC	-	Mission Operations Center
NASA	-	National Aeronautics and Space Administration
NCR	-	Nonconformance Report
NOAA	-	National Oceanic and Atmospheric Administration
NPG	-	NASA Procedures and Guidelines
NRA	-	NASA Research Announcement
OMNI	-	Operating Missions as Nodes on the Internet
OS	-	Operating System
OSS	-	Opportunities in Space Science
PC	-	Personal Computers
PDA	-	Palm Digital Assistant
PI	-	Primary Investigator
POSIX	-	Portable Operating System Interface (UNIX)
QMS	-	Quality Management System



ACRONYMS



ROSS	- Rewritable Optical Storage System
RTEMS	- Real-Time Executive for Multi-Processor Systems
SMART	- Scientist's Mission Assistant and Research Tool
SMEX	- Small Explorer
SN	- Space Network
SOIF	- Standard On-Board Interfaces
SOMO	- Space Operation Management Office
SOW	- Statement of Work
SSSOT	- SOMO Standard Services Ordering Tool
SWSI	- Space Network Web Services Interface
TDRS	- Tracking and Data Relay Satellite
USN	- Universal Space Network
UNO	- University of Northern Oklahoma
UVA	- University of Virginia
WGISS	- Working Group on Information System and Services
WIRE	- Wide-Field Infrared Explorer
XML	- Extensible Markup Language